

2.1 Economic activity – The level of overall economic activity

Learning Outcomes

- Describe, using a diagram, the circular flow of income between households and firms in a closed economy with no government.
- Identify the four factors of production and their respective payments (rent, wages, interest, and profit) and explain that these constitute the income flow in the model.
- Outline that the income flow is numerically equivalent to the expenditure flow and the value of output flow.
- Describe, using a diagram, the circular flow of income in an open economy with government and financial markets, referring to leakages/withdrawals (savings, taxes, and import expenditure), and injections (investment, government expenditure, and export revenue).
- Explain how the size of the circular flow will change depending on the relative size of injections and leakages.

Describe the circular flow of income model for a closed economy

A country has a closed economy when it does not trade with other countries.

The model is a simplified representation of how **income** moves through the economy. There are two sectors in this model: households and firms. Government, banks, and international trade are not included at this stage.

Model sentence: Households own all the **factors of production**. Firms hire the factors from households in order to produce goods and services. Using the payments for the factors of production, households buy the goods and services from the firms.

This information is set out in Figure 40.1, a simple model of the circular flow of income in a closed economy.

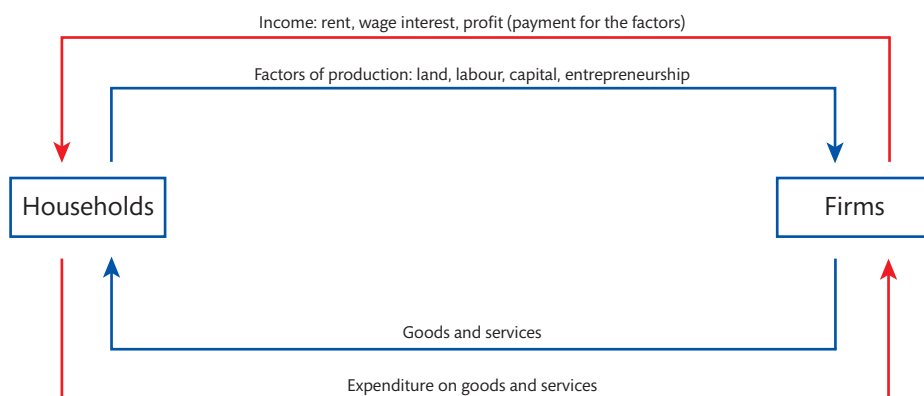


Figure 40.1

The flow of income – a step-by-step guide

Trouble shooter

1. Households own all the factors. The firms hire them from households in order to produce goods.
2. Payments for the factors flow from firms to the households. The goods and services are sold to the households.
3. The households buy the goods and services from the firms using the income received for the use of the factors.

The model shows **resources** flowing from households to firms and goods and services flowing from firms, to households. These are called real flows. In order to **facilitate** the exchange of resources for goods and services a society needs money. Money flows from the firms to the households as payment for the use of the factors of production and money flows from the households to the firms as payment for the goods and services.

Subject vocabulary

income the payment received by the factors of production (e.g. wages paid to labour, rent paid to the owners of land)

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

resources the inputs into the production process, the factors of production

Synonyms

facilitate.....make possible

Subject vocabulary

land this factor includes not only the physical land, which is usually a fixed resource, but also the natural resources obtained from the land and sea, some of which are renewable, such as timber

labour the people available to work with capital and land in order to produce output

capital manufactured goods that are used in the production of other goods

entrepreneurship the process of bringing together factors of production in order to produce goods or services with the aim of making a profit

public good a good that is non-excludable and non-rival. Once provided it is not possible to stop people benefitting from the consumption of it and therefore people free ride - they do not pay. The good will not be supplied left to the free market because no firm would be able to make a profit. Also, consumption of the good by one person does not diminish the amount available for others to consume.

merit good a good/service that the government believes will be under consumed left to the free market. Consumption of a merit good may generate positive externalities, therefore the social benefit of consumption is greater than the private benefit. Individuals do not take into account the positive externalities when deciding the amount to consume, therefore the good is underprovided and under consumed.

tax revenue the income the government receives through the levying and collection of taxes

interest the price paid for the use of borrowed money/ the money earned from bank deposits

interest rate the percentage amount charged by a lender for money borrowed

Glossary

national defence the systems that a country uses to defend itself against attack

Synonyms

proportion amount

Identify the four factors of production and their respective payments

The four factors of production are **land**, **labour**, **capital**, and **entrepreneurship**. Rent is the payment made for the use of land and includes payment for the use of the natural resources taken from the land. Wage is the payment for the use of labour. Interest is the payment for the use of capital and profit is the reward for enterprise and risk taking. These are the four components of income: rent, wage, interest, and profit.

Model sentence: There are four components of income paid by firms to households. Rent paid for the use of land, wage for labour, interest for capital, and profit for enterprise.

The flow of income in the model – a step-by-step guide (see Figure 40.1)

Trouble shooter

Money complements real flows.

Money acts as a means of exchange: Factors are exchanged for money and goods are exchanged for money.

This money earned by the factors and paid by the firms is collectively called income.

Income flows from firms to household as payments made for the use of the factors of production.

The income earned by households flows back to firms as payment for the goods produced using the factors.

Incomes flow between firms and households in this way continuously.

Outline that the income flow is numerically equivalent to the expenditure flow and the value of output flow

In this simple model no income leaks out of the circular flow. Therefore the income paid by firms to households for use of the factors is equal to the amount of income spent by households in exchange for the goods and services the firms produce. Therefore the monetary value of the goods and services flowing from firms to households is equal to the flow of households' expenditure on them.

Model sentence: The income earned by the factors of production = the expenditure on the goods and services = the value of the goods and services.

Describe, using a diagram, the circular flow of income in an open economy

A country has an open economy when it trades with other countries. Elements need to be added to the circular flow in order to make it more representative of real economies.

Households do not spend all income earned on goods produced domestically. Some income is spent on imports and goes to firms abroad. Some income is taxed and goes to the government. Some income can be saved and this goes to banks and other financial institutions such as pension providers.

These income flows are called leakages or withdrawals from the circular flow and are shown in Figure 40.2 as imports, savings, and taxes.

The government taxes income and spends it on, for example, **public goods** such as **national defence** and **merit goods** such as education and health. The expenditure of government **tax revenue** is an injection into the circular flow and it goes to firms in exchange for the goods and services and in turn the money goes to households as income paid for the use of the factors needed to make them.

Firms borrow money from banks in order to buy **capital** goods. This investment is funded by borrowed money. Some households save a **proportion** of income at banks for which the banks pay **interest**. The banks then lend the money to firms for which the firms pay interest. The **interest rate** on borrowing is greater than the rate for savings. In this way banks make a profit. Investment, which is the addition to capital stock, is an injection into the circular flow. The money goes to firms who produce capital goods and services. In turn the money goes to the households as income.

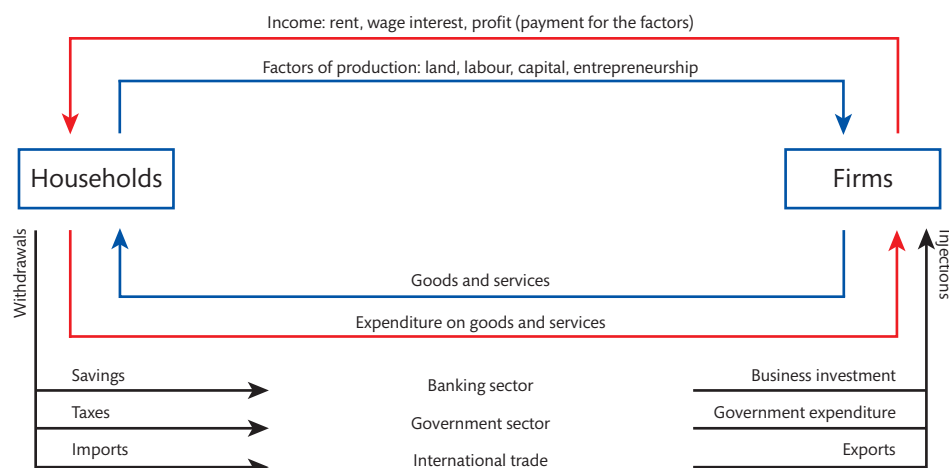


Figure 40.2

Many **domestic firms** sell their goods and services abroad, exporting goods to foreign buyers all over the world. Consumers in the rest of the world buy the goods and the money flows to the domestic firms. It is an injection into the circular flow. It is a flow of money coming from abroad to the domestic firms and in turn the money flows to households as payment for the factors.

Model sentence: Tax on income leaks out of the circular flow so that government expenditure can be injected into the circular flow, income saved leaks out so that investment can be injected in and income spent on imports leaks out while income spent on exports is injected in.

Explain how the size of the circular flow will change

The leakages and injections into the circular flow are not always equal. Often **government expenditure**, an injection, exceeds tax revenue, a leakage. When this happens the government is running a **budget deficit**. The government must borrow the difference from the financial markets. The **accumulation** of budget deficits is called the **national debt**: the total amount the government owes. Households save a certain proportion of their income but firms might be borrowing less for investment than the amount saved, therefore in this case the leakage exceeds the injection. The amount of income spent on imports might be greater than the income spent by foreigners on **exports**. This leads to a **current account deficit**: a situation where expenditure on imports > expenditure on exports. More money is flowing out of the circular flow than is flowing in with respect to international trade. When leakages > injections, the amount of income flowing round the circular flow falls and when injections > leakages, the amount increases.

The government can act to correct an imbalance between leakages and injections. Reducing the interest rate on loans for investment will increase investment. However, in most countries it is the central bank that controls the interest rate not the government.

Cuts in government expenditure will reduce the budget deficit and the government's borrowing requirements. Government can increase tax rates so that tax revenue equals government expenditure. Subsidies given to exporting industries will increase the demand for and expenditure on exports thereby reducing the current account deficit.

Test your understanding of this unit by answering the following questions

- State the four factors of production along with their respective payments.
- Describe, using a diagram, how factors and money move between firms and households in the circular flow of income model for a closed economy.
- Explain, using a diagram, why income = expenditure = value of goods and services.
- Describe, using a diagram, the circular flow of income in an open economy with leakages and injections.

Subject vocabulary

domestic firm a firm that produces its output in the home country

government expenditure spending by a government in a specified period of time on such things as transport infrastructure, welfare payments, national defense, education, and health services which is financed by tax revenue and borrowing

budget deficit occurs when government expenditure is greater than tax revenue

national debt the total amount of money a government has borrowed. When a government runs a budget deficit it must borrow the difference thereby adding to the national debt

exports goods produced in one country that are sold into another country

current account deficit occurs when the amount of money flowing out of a country from the trade in goods and services, investment income, and transfers is greater than the amount flowing in

Glossary

accumulation a gradual increase over a period of time

Learning Outcomes

- Distinguish between gross domestic product (GDP) and gross national product (GNP)/**gross national income** (GNI) as measures of economic activity.
- Distinguish between the nominal value of GDP and GNP/GNI and the real value of GDP and GNP/GNI.
- Distinguish between total GDP and GNP/GNI and per capita GDP and GNP/GNI.
- Examine the output method, the income method, and the expenditure method when measuring national income.
- Evaluate the use of national income statistics, including their use for making comparisons over time, their use for making comparisons between countries, and their use for making conclusions about standards of living.
- Explain the meaning and significance of 'green GDP', a measure of GDP that accounts for environmental destruction.

Subject vocabulary

gross national income the sum of incomes (rent, wages, interest, and profit) earned by residents of a country in a given period of time, including earnings from overseas investments, less the amount foreigners earn in the country that is sent back to their home countries

monetary value the amount of a currency that a buyer is willing to pay for a good or service

inputs the resources used to produce goods

resources the inputs into the production process, the factors of production

revenue the income a firm receives from consumers in exchange for goods (revenue = price \times quantity sold)

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

gross domestic product the monetary value of all the finished goods and services produced within a country in a given period of time, usually measured over a year

market price the price determined by the interaction of demand and supply in a competitive market

final goods a finished good that does not require further processing

How is gross domestic product (GDP) measured?

There are three ways GDP is calculated:

The output method

This is the sum of the **monetary value** added to the **inputs** in the production process by all the firms in the economy in a given year. The costs of the inputs or **resources** used in the production process are subtracted from the sales **revenue** (price \times quantity sold) in order to calculate the monetary value added by the firm. This means that the inputs are not double counted.

The income method

This is a measure of the sum of all income earned by households in a given year. It is the sum of all payments made by firms to households for the use of the **factors of production**. Total income is the sum of rent, wages, interest, and profit.

The expenditure method

This is a measure of the monetary value of total spending on goods and services in a given year.

Model sentence: Total expenditure is the sum of household expenditure on domestically produced goods (C), expenditure by firms on capital goods which is investment (I), expenditure by government (G), and expenditure on exports by foreigners minus expenditure on imports (X-M).

As explained earlier; the income earned by the factors of production = the expenditure on the goods and services = the value of the goods and services. Although the monetary value of a country's output can be measured in these three ways the value will be the same in each case.

The following are acceptable definitions of **gross domestic product**. GDP is the monetary value at **market price** of all **final goods** and services produced in a country in a given year. It can also be defined as the sum of all expenditure in a country in a given year. This can be expressed algebraically as $GDP = C + I + G + (X - M)$.

Distinguish between gross domestic product (GDP) and gross national product (GNP)/gross national income (GNI)

GDP is a measure of the value of all final goods and services produced in a country in a given year. No account is taken of the ownership of the factors of production. As long as the goods and services are produced in the country the value of them is included in GDP. However, there are many firms producing output in a country that are owned by foreigners. For example, the Australian bank Macquarie operates in the UK. The value of its output is included in the GDP of the UK but is not included in Australia's GDP. The profits earned by the bank are included in the UK's GDP but not in Australia's GDP.

GNP/GNI includes the income generated by a country's factors wherever in the world the country's factors are located. So the profit earned by Macquarie in the UK is included in Australia's GNP/GNI. The income earned on overseas **assets** is called property income from abroad.

GNP/GNI is a measure of income that is earned based on the ownership of the factors. In order to calculate GNP income paid to foreign factors (such as profit made by the foreign firms) is subtracted from GDP. Then the income earned by domestically owned factors operating in foreign countries is added. The difference between them is called net property income from abroad. Therefore $\text{GNP/GNI} = \text{GDP} + \text{net property income from abroad}$.

Many developing countries try to encourage **foreign direct investment** to raise GDP. In such a country where many foreign firms own **productive capacity** its GDP is greater than GNP. Income earned is included in the GDP but often does not stay in the country. Some of the income flows back abroad. For example, profits flow out of the country to the firms' country of origin and foreign workers often send wages back home. This again is a loss of income. Because the income is not spent in the country it does not contribute to economic growth.

What is net national product?

Capital does not last forever. The capital stock of a country is continuously losing its value and must at some point be replaced. This occurs because of 'wear and tear': damage caused to the capital through use. The loss in value of the capital stock is called depreciation and the expenditure to replace it is called capital consumption. This capital is replaced. This **investment** does not add to the productive capacity of the country although it is included in GNP. So growth of GNP year on year is at least in part because firms have been replacing capital therefore GNP is not an accurate measure of actual increases in productive capacity. To get a more accurate indicator of the economy's current performance and its potential performance the expenditure on replacement capital, which is called capital consumption, is not included in the calculation of net national product. $\text{NNP} = \text{GNP} - \text{capital consumption}$. Another way of stating it is $\text{NNP} = \text{GNP} - \text{depreciation}$.

Distinguish between nominal GDP and real GDP

Calculation of GDP is achieved through the addition of the stated price of all final goods produced in a country in a given year. GDP which measures the value of output in current prices is called **nominal GDP**. Increases in GDP year on year can come about partly because prices increase. In other words increases in GDP can occur because of **inflation** rather than an increase in economic performance. Nominal GDP will overstate any increase in the value of output.

To obtain an accurate indicator of the actual value of the output from one time period to another the effects of inflation must be taken into account. Nominal GDP is adjusted to take into account the effects of inflation on the value of output in order to value output at constant prices. **Real GDP** = nominal GDP adjusted for inflation.

Model sentence: The word real placed in front of a variable, such as GDP and interest rate, means that the effect of inflation on its true value has been taken into account thereby allowing a valid comparison of the variable over time.

What is GDP per capita (per head)?

GDP per capita is GDP divided by the population of the country. This is a useful statistic because it is a more realistic indicator of economic performance and the **standard of living** of people living in the country. Total income earned in 2012 in Brazil was \$2,500,000 million. The same income was earned in the UK. On these figures alone it is impossible to make a judgement concerning standards of living. The two countries may have generated the same total income but the population of Brazil is greater than the UK's. Income per capita in Brazil in 2012 was \$12,000 whereas in the UK it was \$39,000.

Evaluate the use of national income statistics

What is the purpose of the statistics?

One of the key macroeconomic objectives of a government is economic growth. GDP is an indicator of growth. The government needs the statistics year on year to assess the effectiveness of their economic policies. If GDP rises it is evidence of growth. If GDP falls or 'flat lines' the government may decide to change economic policy. Also, in a democracy, the people use information on GDP when considering voting intentions. This is because GDP is considered to be an indicator of the standard of living. Investment by firms in productive capacity is

Subject vocabulary

asset an item of value owned by an individual or firm, especially one that could be converted to cash

foreign direct investment cross-border investment, usually by firms, that involves the acquisition of assets in a foreign country. FDI can be the purchase of a minimum of 10% of the shares of a foreign company but also includes the creation of productive capacity.

productive capacity the maximum possible output of a firm, industry, or an economy

capital manufactured goods that are used in the production of other goods

investment the addition to capital stock

nominal GDP gross domestic product that has not been adjusted to take into account the effect of inflation

inflation an increase in the general level of prices of goods/services in an economy over a given time period, usually a year

real GDP the value of all output of an economy produced in a given period of time, usually a year, adjusted to take into account the effect of inflation

GDP per capita equals gross domestic product of a country divided by the population

standard of living a level of well-being of a person or groups of people

Subject vocabulary

hidden economy part of the economy where illegal and untaxed trade occurs

productivity the quantity of output per unit of input

output the quantity of goods produced by a firm, industry or economy

external cost occurs when the production or consumption of a good creates a cost that must be paid by third parties

negative externalities occur when the production or consumption of a good creates costs that must be paid by third parties. The existence of negative externalities means that social cost is greater than private cost.

third parties people who are not directly involved in a transaction but are nevertheless affected by the transaction. People who are external to the market.

green GDP green GDP equals GDP minus the negative externalities of production

nominal value the value expressed in monetary terms, not adjusted for inflation

real value the nominal or numerical value adjusted to take into account the effect of inflation

Synonyms

refined fine-tuned

understated... described as smaller than it actually is

Glossary

degradation becoming worse in condition

always a risk. GDP is an indicator of future levels of demand. If economists predict growth in GDP it increases business confidence and firms are more likely to invest. There are, however, matters that should be taken into account when drawing conclusions based upon GDP statistics.

Income distribution

GDP per capita is a better indicator than GDP of standards of living in a country. However, this statistic does not take into account the distribution of income. Income in all countries is distributed unequally. In many countries there is a small minority that earns the majority of the total income. Therefore average income per head is not a reliable indicator of the overall well-being of the population.

Accuracy

The task of gathering the information needed to calculate GDP is complex. To obtain highly accurate figures on the value of all final goods produced in a year is difficult. In advanced countries the statistics are likely to be more accurate because the systems used to work out GDP and GNP are well established and have been **refined** over many years. Nevertheless, the accuracy of national statistics cannot be taken for granted.

The hidden economy

Informal markets or black markets exist in all countries. Some economic transactions are not recorded. Jobs are done for 'cash in hand'. An electrician accepts cash for rewiring a house and does not declare his earning to the tax officials in order to avoid paying tax. Some firms pay workers cash in hand in order to avoid taxes associated with the employment of workers. The higher the taxes the greater the incentive to avoid paying them. Illegal transactions are not recorded. Examples include the black market for tobacco and other drugs. In less developed countries agricultural goods produced go unrecorded as the output is consumed by those who grow it. All the above occurs in the '**hidden economy**'. Black markets are usually bigger in developing countries. Governments have less control over markets therefore the informal sector accounts for a relatively higher proportion of GDP than in developed countries.

The GDP of a country is **understated** and the extent to which it is depends in part on the size of the hidden economy. However, the value of the goods and services produced and consumed in the hidden economy varies considerably between countries making comparisons of national statistics across countries less valid.

Voluntary work for charities and other organizations is not recorded and yet such activity has a major impact on the well-being of many in society. Housework and bringing up children are essential activities for a successful economy, but are not included in the statistics.

Negative externalities

Increases in GDP are a reflection of increasing **productivity** and output. When more firms produce more **output** there are increases in the **external costs** associated with production such as noise and air pollution and traffic congestion. Such **negative externalities** have a damaging effect on **third parties**. For example, health problems are caused by the poor quality of the air in urban and industrial areas and climate change could be accelerated by rapid increases in economic activity. The relatively unregulated building of factories can have a negative impact on the landscape. Economic activity impacts on the quality of life for many living now and for future generations. These negative consequences should be taken into account when examining the impact of increasing GDP on the standard of living and welfare of the population.

Explain the meaning and significance of 'green GDP'

Negative externalities are created in production. The calculation of **green GDP** takes into account the external costs such as environmental **degradation** noise, air, and water pollution, the costs of clearing up and dealing with industrial waste, and assessing the costs of climate change.

Green GDP = Actual GDP – the external costs of production

The task of evaluating the external costs is a huge one. The extent of environmental damage is difficult to assess and of course any value placed on external costs associated with climate change is controversial and highly debatable.

Test your understanding of this unit by answering the following questions

- Distinguish between GDP and GNP.
- Distinguish between the **nominal value** of GDP and the **real value** of GDP.
- Describe the output, the income, and the expenditure methods of measuring national income.
- Discuss the usefulness of GDP as a measure of economic well-being.

Learning Outcomes

- Calculate **nominal GDP** from sets of **national income** data, using the expenditure method (HL).
- Calculate GNP/GNI from data (HL).
- Calculate real GDP, using a price deflator (HL).

Calculate nominal GDP from national income data using the expenditure method (HL)

Total expenditure is the sum of household spending on domestically produced goods (C), spending by firms on capital goods and services (I), spending by government (G), and spending on exports by foreigners minus spending on imports (X-M).

Data in Table 42.1 shows expenditure in all the categories stated above at current prices. Nominal GDP = $C + I + G + (X-M)$ (US bureau of economic analysis).

Table 42.1 shows the breakdown of expenditure in the US in 2009.

Expenditure	\$ Billion
Household expenditure on the consumption of domestically produced goods/services (C)	10,001
Expenditure by firms on domestically produced capital goods/services (I)	1590
Government expenditure (G)	2914
Expenditure on exported goods/services minus expenditure on imported goods/services (X-M)	-386
Gross domestic product: $C + I + G + (X-M)$	14,119

Source: US bureau of economic analysis

Table 42.1

The sum of all expenditure, $C + I + G + (X-M)$, is \$14,119 billion. This is a relatively easy calculation to make. You might be asked in paper 3 to calculate the contribution of each category to total GDP.

Calculation of the contribution of government expenditure (HL) – a step-by-step guide

Trouble shooter

The contribution of government expenditure as a percentage of GDP =

$$\frac{\text{Government expenditure}}{\text{GDP}} \times 100$$

$$\frac{2914}{14,119} \times 100 = 0.2064 \times 100 = 20.64\%$$

Government expenditure accounted for 20.64% of GDP.

Calculate nominal GDP from national income data using the income method (HL)

The income method of calculating GDP is done by adding the payments made by firms to households for the use of the **factors of production**. In paper 3 you may be shown a table listing the income earned. Total income is the sum of wages, rents, interest, and profit. If asked to calculate the contribution of one category of income as a percentage of GDP calculate it by following, in principle, the example shown in the trouble shooter above.

Calculate real GDP, using a price deflator (HL)

Nominal GDP is the value of **final goods** produced in a given year at current prices. However, prices can increase each year. Therefore, increases in nominal GDP are caused, in part at least, by **inflation** (inflation will be covered in detail later). Governments and economists want to know the proportion of any increase in GDP that is not caused by inflation. Increases in **real output** might be the result of increases in **productivity**, international competitiveness, **foreign direct investment**, and more firms setting up in business in the country. In order to calculate real GDP over a given period of time the effects of inflation must be taken into account.

Subject vocabulary

nominal GDP gross domestic product that has not been adjusted to take into account the effect of inflation

national income the sum of all income earned in a country in a given period of time

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

final goods a finished good that does not require further processing

inflation an increase in the general level of prices of goods/services in an economy over a given time period, usually a year

real output the quantity of goods and services produced in a given time period

productivity the quantity of output per unit of input

foreign direct investment cross-border investment, usually by firms, that involves the acquisition of assets in a foreign country. FDI can be the purchase of a minimum of 10% of the shares of a foreign company but also includes the creation of productive capacity.

To calculate real GDP economists use a deflator to take into account the effect of inflation. The index deflates or reduces nominal GDP so that the stated GDP represents the value of actual output.

The formula used to calculate real GDP is: $\text{real GDP} = \text{nominal GDP} / \text{GDP deflator} \times 100$

Calculate real GDP from the data using a deflator (HL) – a step-by-step guide

Trouble shooter

Country X's nominal GDP in 2011 was \$980 billion.

Country X's nominal GDP in 2013 was \$1,300 billion.

The rate of inflation between 2011 and 2013 was 11%.

GDP deflator = base year index 100 + rate of inflation = $100 + 11 = 111$.

Nominal GDP in 2013 = \$1300 billion and the GDP Deflator = 111.

Real GDP = $\text{nominal GDP} / \text{GDP deflator} \times 100$.

Real GDP = $\$1300 / 111 \times 100 = 11.7117 \times 100 = \1171.17 billion.

Real GDP has increased by \$191.17 billion ($\$1171.17 - \980).

Subject vocabulary

real economic growth a measure of economic growth over a given period of time expressed as a percentage and adjusted to take into account the effect of inflation on its value

negative economic growth a fall in GDP over a given period of time measured as a percentage and adjusted for inflation

Calculate the rate of real economic growth (HL)

Real economic growth is an increase in real GDP over a given time period. **Negative economic growth** is a fall in real GDP over a given time period. It is measured as a percentage change.

A change in economic growth is calculated using the formula:

$$\text{Percentage change in real GDP} = \frac{\text{the new real GDP} - \text{the original GDP}}{\text{the original GDP}} \times 100$$

Carrying on with the example above between 2011 and 2013 there has been an increase in real GDP of $\$1171.17 \text{ billion} - \$980 \text{ billion} = \$191.17 \text{ billion}$.

$$\text{Percentage change in real GDP} = \frac{\$1171.17 \text{ billion} - \$980 \text{ billion}}{\$980 \text{ billion}} \times 100 = \frac{\$191.17}{\$980} \times 100 = 0.1951 \times 100 = 19.51\%$$

The rate of economic growth between 2011 and 2013 was 19.51%.

In HL paper 3 you might be tested on how to calculate real GDP, the GDP deflator and economic growth. Below are examples of types of questions you could be asked along with the answers.

1. Nominal GDP of a country was \$12,100 billion in 2012. This increased to \$13,200 billion in 2013. The rate of Inflation in 2013 was 5%.

Calculate real GDP for 2013 (HL) – a step-by-step guide

Trouble shooter

2012 is the base year and the index is 100.

Inflation rate in 2013 was 5%.

The index number for year 2, 2013 is $100 + 5 = 105$.

GDP deflator = 105.

Nominal GDP in 2013 = \$13,200 billion.

$$\text{Real GDP} = \frac{\text{nominal GDP}}{\text{GDP deflator}} \times 100$$

$$\text{Real GDP} = \frac{\$13,200}{105} \times 100 \text{ simplify by dividing 100 by 105.}$$

$$\text{Real GDP} = \$13,200 \times 0.9524 = \$12,571.43 \text{ billion.}$$

The GDP deflator can be calculated using the formula: $\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100$

To work out the deflator using this formula nominal and real GDP must be known.

2. Nominal GDP of a country in 2013 was \$840 billion and the real GDP in 2013 was \$720 billion.

Calculate the GDP deflator and inflation rate for 2013 (HL) – a step-by-step guide

Trouble shooter

Nominal GDP = \$840.

Real GDP = \$720.

$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100$

$\text{GDP deflator} = \frac{840}{720} \times 100$ simplify by dividing 840 by 720.

$\text{GDP deflator} = 1.166 \times 100 = 116.67$.

$\text{Inflation rate} = \text{GDP deflator} - \text{base year index} = 116.67 - 100 = 16.67$.

The rate of inflation in 2013 was 16.67%.

3. Real GDP of a country in 2012 was \$960 billion. It increased in 2013 to \$1000 billion.

Calculate the rate of economic growth in 2013 (HL) – a step-by-step guide

Trouble shooter

Economic growth is an increase in real GDP from one year to the next. It is the percentage change in real GDP from one year to the next.

A change in economic growth is calculated using the formula:

$\text{Percentage change in real GDP} = \frac{\text{the new real GDP} - \text{the original real GDP}}{\text{the original real GDP}} \times 100$

$\text{Percentage change in real GDP} = \frac{1000 - 960}{960} \times 100$ simplify by subtracting 960 from 1000.

$\text{Percentage change in real GDP} = \frac{40}{960} \times 100$ simplify by dividing 40 by 960.

$\text{Percentage change in real GDP} = 0.04166 \times 100$.

$\text{Percentage change in real GDP} = 4.167\%$.

The rate of economic growth in 2013 was 4.167%.

Test your understanding of this unit by answering the following questions

- Nominal GDP = \$ in year 1 was \$640 billion. In year 2 the rate of inflation was 6% and the nominal GDP was \$700 billion. Calculate real GDP for year 2.
- Nominal GDP in 2013 was \$740 billion and the real GDP in the same year was \$780. Calculate the GDP deflator and the rate of inflation for 2013.
- Real GDP in a country in 2012 was \$860 billion. It increased in 2013 to \$940 billion. Calculate economic growth in percentage terms for 2013.

Learning Outcomes

- Explain, using a business cycle diagram, that economies typically tend to go through a cyclical pattern characterized by the phases of the business cycle.
- Explain the long-term growth trend in the business cycle diagram as the potential output of the economy.
- Distinguish between a decrease in GDP and a decrease in GDP growth.

Subject vocabulary

business cycle the fluctuations in economic activity over time. There are four stages of the business cycle: (1) recession, when economic activity slows down; (2) trough, when the recession is at its deepest; (3) recovery, when the economy begins to grow; and (4) peak/boom, when economic activity is high.

potential output the maximum output an economy can produce when all resources are efficiently employed

factors of production the inputs into the production process (land, labour, capital and entrepreneurship)

economic growth an increase in real GDP

recession two consecutive quarters of negative economic growth

inflation an increase in the general level of prices of goods/services in an economy over a given time period, usually a year

Glossary

fluctuation(s) frequent change(s) especially from a high to a low level and back again

slope the angle/gradient of the curve

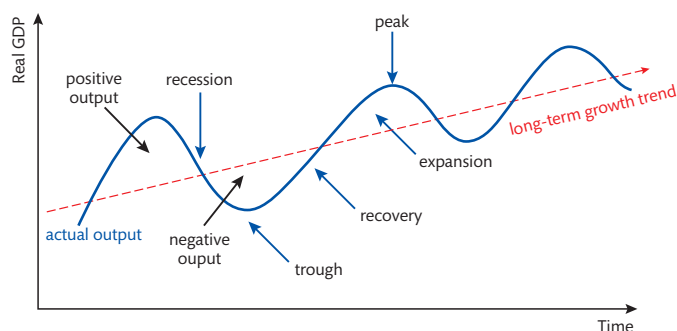
made redundant being told by your employer that there is no longer a job for you

Synonyms

diminishing.....becoming smaller

Using a business cycle diagram, explain that economic growth is not constant but cyclical

The **business cycle** (also called the economic cycle or the trade cycle) shows increases and falls in real GDP over a given period of time. Over time the economy expands and contracts. In a 50-year period, for example, real GDP increases. The capacity of the economy to produce goods and services increases. Over time the level of **potential output** increases. Potential output is the level of output that can be achieved when all the **factors of production** are employed. This is shown by the long-term growth trend in Figure 43.1. However, during this



period of time there have been **fluctuations** in the rate at which the economy has grown. The change in real GDP over time in the short-term fluctuates, shown by the line that rises and falls above and below the long-term trend line. The fluctuating line shows changes in actual output in the short-term.

Figure 43.1

Initially in Figure 43.1 the rate at which the economy is growing is increasing as illustrated when the actual output line **slopes** upwards. Eventually the rate at which the economy grows begins to decrease. The economy is still growing but at a **diminishing** rate. For example, in a particular year the economy grows by 3%. The following year it grows by 2% and the year after by 1%. **Economic growth** is positive and increasing but it is increasing at a decreasing rate. It rises and then reaches a peak. As time moves on economic growth becomes negative; the economy contracts and real GDP falls. Therefore the actual output line slopes downwards. If the rate of economic growth is negative over two consecutive quarters of the year (6 months) it is called a **recession**. When real GDP has reached its lowest point it is called a recessionary trough. During this period of recession real output is falling. Firms are reducing output in response to falling levels of consumption and a lack of confidence in future levels of demand. Firms will go out of business, factories will close, and workers will be **made redundant**. Unemployment of labour and other factors rise.

When consumption rises and business confidence returns, firms respond by employing more factors of production in order to increase output. The economy, although at a low point, begins to grow. Economic growth is positive and the actual output line slopes upwards again. The economy is now in the recovery phase. As consumption and business confidence continues to grow firms employ more and more factors to boost output and real GDP begins to rise at an increasing rate. Unemployment of the factors of production begins to fall. The economy is expanding and does so until it reaches the peak. At this point demand for goods and services is very high and firms may not be able to increase supply enough to keep up with the very high levels of demand. This can lead to **inflation**. The government might introduce policies to reduce excess demand and thereby lower inflationary pressures (these policies are discussed in detail on pages 152–54). Such policies may cause the economy to move into a period of negative economic growth. The actual output line slopes downwards at this point as the economy potentially enters a recessionary phase of the business cycle.

One complete business cycle measured from one recession to the next can last a relatively long time. In 1990 the UK moved into recession. The economy entered the recovery phase in 1993 starting a long period of positive economic growth until the recession of 2008. This business cycle was 15 years long.

Distinguish between potential output and actual output

The long-term trend line shows a **uniform** increase in real output over time. It shows the potential output of an economy. The actual output line shows the fluctuations above and below the long-term potential level of output that occurs in the short-term over time. At times the economy is performing below its potential. Real GDP is less than the **potential GDP**. This is called a **negative output gap**. It is characterized by relatively high levels of unemployment of the factors of production and relatively low rates of inflation. When real GDP is above the long-term potential there is a **positive output gap**. Total demand in the economy exceeds potential output. This is characterized by low levels of unemployment and increasing rates of inflation as the economy 'overheats' as short-term output exceeds the capacity of the economy to supply goods and services. This **trade-off** between levels of employment and inflation is discussed in detail on pages 155–58.

Model sentence: When actual output is greater than potential output there is a positive output gap and the economy has no or little spare capacity. When actual output is less than potential output there is a negative output gap and the economy has at least some spare capacity.

Distinguish between a decrease in GDP and a decrease in GDP growth

Model sentence: A decrease in GDP growth occurs when the rate of economic growth is positive and increasing but at a diminishing rate. A decrease in GDP occurs when the rate of economic growth is negative.

Test your understanding of this unit by answering the following question

- Using a business cycle diagram, explain the terms positive output gap and negative output gap.

Glossary

uniform being the same in all its parts

trade-off a situation that involves giving up something in return for gaining another thing

Subject vocabulary

potential GDP the total gross domestic product an economy can produce when all factors of production are fully and efficiently employed

negative output gap a situation in which an economy's actual output is less than its potential output

positive output gap occurs when actual GDP is greater than potential GDP leading to inflation.